TASK 7. WARMWATER FISH BELOW WOODBRIDGE DAM

7.1 OBJECTIVE

The objective of this task was to document use of the Lower Mokelumne River from Woodbridge Dam to the extent of tidal influence (Woodbridge reach) by native warmwater fishes and important introduced species (i.e., striped bass and American shad).

7.2 METHODS

A literature and information search was conducted on native warmwater and important introduced fish species (American shad and striped bass) collected in the Lower Mokelumne River. Sources included EBMUD, state and federal resource agencies, the University of California at Berkeley, the University of California at Davis, and BioSystems' in-house library and data bases. The review focused on native fishes and commercially important introduced species inhabiting the Mokelumne River from Woodbridge Dam to the extent of tidal influence (Ray Road). The upstream limit of the search was defined as Woodbridge Dam since the primary riverine habitat for warmwater fishes is downstream of the dam. Further, striped bass and American shad are not known to migrate past Woodbridge Dam. The downstream limit of the reach was defined as the extent of tidal influence since the hydrology and species composition downstream from this point changes considerably.

7.3 RESULTS

Historically, the Lower Mokelumne River provided habitat or served as a migration route for chinook salmon (*Oncorhynchus tshawytscha*), steelhead rainbow trout (*Oncorhynchus mykiss*), California roach (*Hesperoleucus symmetricus*), hitch (*Lavinia exilicauda*), lamprey (*Lamprey* spp.), Sacramento blackfish (*Orthodon microlepidotus*), Sacramento squawfish (*Ptychocheilus grandis*), Sacramento sucker (*Catostomus occidentalis*), tule perch (*Hysterocarpus traski*), and white sturgeon (*Acipenser transmontanus*) (Turner and Kelley 1966; Moyle 1976). There have been reports of numerous introduced species including American shad (*Alosa sapidissima*), striped bass (*Morone saxatilis*), bullhead (*Ictalurus* sp.), white catfish (*Ictalurus* sp.), golden shiner (*Notemigonus crysoleuces*), mosquitofish (*Gambusia affinis*), and largemouth bass (*Micropterus salmoides*) and smallmouth bass (*Micropterus dolomieui*) (Hatton 1940, 1942; Turner 1966a). However, the previous studies included fish collected in the tidally influenced portion of the Lower Mokelumne River.

Little research has been conducted on the fishery resources of the Mokelumne River from Woodbridge Dam to the extent of tidal influence, except for chinook salmon. Most of the information on other species is from anecdotes included in salmon studies, or sparse comments on Mokelumne River fish in overviews of the Central Valley fishery resources. In recent years, only three field studies have been conducted in the Lower Mokelumne River to determine the fishery resources (CDFG 1991; EBMUD and BioSystems data files 1990-1992). However, the CDFG study surveyed tidally influenced regions of the river

downstream to New Hope Marina and did not identify the capture location of each species. Therefore, the discussion was limited to the two surveys conducted exclusively between Woodbridge Dam and the extent of tidal influence (EBMUD and BioSystems data files).

Table 7.1 summarizes the sampling methods employed in the recent field studies. Electrofishing surveys were conducted between Woodbridge Dam and the extent of the tidal influence in April and June of 1990 (BioSystems data files) and verified the presence of at least 23 fish species (all fish were not identified to species) (Table 7.2). The most abundant fish were bluegill (*Lepomis macrochirus*), smallmouth bass, and spotted bass *(Micropterus punctulatus*). Other species of interest included steelhead rainbow trout, largemouth bass, and chinook salmon.

A total of twelve seining surveys were conducted by EBMUD in the Woodbridge reach during 1990 (April-May), 1991 (February-May) and 1992 (March-May). These surveys verified the presence of 18 species (Table 7.2). The most abundant of which were mosquitofish, bluegill, and Sacramento sucker. Chinook salmon, steelhead rainbow trout, largemouth bass, and catfish were also captured.

The BioSystems and EBMUD field studies documented 26 species in the Lower Mokelumne River, including several economically important species. None of the findings indicates American shad or striped bass in the lower river in 1990 - 1992. Since the surveys were conducted during the typical spawning and rearing period for these fish, the results would suggest that the Lower Mokelumne River was not utilized by these species in the last three years. However, all of these were dry years and may not represent fish distributions in other years.

Table 7.1. Summary of recent fish surveys in the Woodbridge reach of the Lower Mokelumne River.

STUDY	NUMBER: SPECIES CAUGHT	NUMBER: SITES	NUMBER: SURVEYS	TOTAL SAMPLES	LOCATION	SURVEY DATES
EBMUD[1]	18	6	12	22*	Woodbridge Dam to tidal influence	April & May 1990 February & May 1991 March & May 1992
BioSystems[2]	23	17	2	30*	Woodbridge Dam to tidal influence	April & June 1990

*All sites were not sampled each survey
[1]EBMUD data files
[2]BioSystems data files

Table 7.2. Fish species in the Woodbridge reach of the Lower Mokelumne River. Asterisks (**) indicate fish present in survey.

COMMON NAME	SCIENTIFIC NAME	SURVEYS	
		BIOSYSTEMS	EBMUD
NATIVE SPECIES			
Pacific lamprey	*Lampetra tridentata*		**
Lamprey[1]	*Lamprey* spp.	**	
Chinook salmon	*Oncorhynchus tshawytscha*	**	**
Steelhead rainbow trout	*Oncorhynchus mykiss*	**	**
Hitch	*Lavinia exilicauda*	**	
Sacramento squawfish	*Ptychocheilus grandis*	**	**
Sacramento sucker	*Catostomus occidentalis*	**	**
Tule perch	*Hysterocarpus traski*	**	
Prickly sculpin	*Cottus asper*		**
Sculpin[1]	*Cottus* spp.	**	
INTRODUCED SPECIES			
Goldfish	*Carassius auratus*	**	
Golden shiner	*Notemigonus crysoleucas*	**	**
Channel catfish	*Ictalurus punctatus*		**
White catfish	*Ictalurus catus*	**	**
Brown bullhead	*Ictalurus nebulosus*	**	
Black bullhead	*Ictalurus melas*	**	
Mosquitofish	*Gambusia affinis*	**	**
Black crappie	*Pomoxis nigromaculatus*	**	**
White crappie	*Pomoxis annularis*		**
Green sunfish	*Lepomis cyanellus*	**	**
Bluegill	*Lepomis macrochirus*	**	**
Pumpkinseed	*Lepomis gibbosus*	**	
Redear sunfish	*Lepomis microlophus*	**	**
Sunfish	*Lepomis* spp.	**	
Largemouth bass	*Micropterus salmoides*	**	**
Spotted bass	*Micropterus punctulatus*	**	
Smallmouth bass	*Micropterus dolomieui*	**	**
Redeye bass	*Micropterus coosae*	**	
Inland silversides	*Menidia audens*		**

[1]Generic fishes are classified (native or introduced) based on the most likely species composition.